



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Alexandria, VA 22313-1450

Customer Number
34132

RECEIVED
COZEN IP DEPT

M12MB

COZEN O'CONNOR, P.C.
1900 MARKET STREET
PHILADELPHIA PA 19103-3508

SEP 21 2005

DUE DATE _____ 9/9/05
MAX DATE _____
DOCKETED BY _____

NOTICE OF CUSTOMER NUMBER ASSIGNMENT TO PATENTS

The request to assign the "customer number" indicated above to each of the patent numbers listed below filed in accordance with the provisions of 37 CFR 1.363 has been ACCEPTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS.

Any further notices relating to the maintenance fee payments and related correspondence for the patent numbers listed will be forwarded to the fee address of record for the customer number identified above.

Patent Number

Application Number

5788178

08888425



US005788178A

United States Patent [19]**Barrett, Jr.**[11] **Patent Number:** **5,788,178**[45] **Date of Patent:** **Aug. 4, 1998**[54] **GUIDED BULLET**[76] **Inventor:** **Rolin F. Barrett, Jr., 4001 George V.
Strong Wynd, Raleigh, N.C. 27612**[21] **Appl. No.:** **888,425**[22] **Filed:** **Jul. 7, 1997****Related U.S. Application Data**[63] **Continuation-in-part of Ser. No. 660,700, Jun. 5, 1996,
abandoned.**[60] **Provisional application No. 60/002,608 Jun. 8, 1995.**[51] **Int. CL⁶** **F41G 7/22**[52] **U.S. Cl.** **244/3.11; 244/3.21; 244/3.24;
102/501**[58] **Field of Search** **244/3.11, 3.13,
244/3.15, 3.16, 3.21, 3.24; 102/293, 501**[56] **References Cited****U.S. PATENT DOCUMENTS**

46,490	2/1865	Orwig .	
412,670	10/1889	Ross .	
1,243,542	10/1917	Moore .	
1,277,942	9/1918	Kaylor .	
3,125,313	3/1964	Sodererg .	244/3.21
3,282,540	11/1966	Lipinski .	
3,860,199	1/1975	Dunne .	
3,977,629	8/1976	Tubeuf .	
4,176,814	12/1979	Albrektsson et al.	244/3.15
4,407,465	10/1983	Meyerhoff .	244/3.16
4,431,150	2/1984	Epperson, Jr. .	
4,537,371	8/1985	Lawhorn et al. .	
4,648,567	3/1987	Maudal et al.	244/3.24
4,711,152	12/1987	Fortunko .	
4,893,815	1/1990	Rowan .	
4,899,956	2/1990	King et al.	244/3.21
4,965,453	10/1990	Hoschette et al.	250/349
5,014,621	5/1991	Fox et al.	102/213
5,280,751	1/1994	Muirhead et al.	102/210

5,282,588	2/1994	August	244/3.3
5,381,445	1/1995	Hershey et al.	375/1
5,419,982	5/1995	Tura et al.	429/162
5,425,514	6/1995	Grosso	244/3.22
5,455,587	10/1995	Schneider	342/62
5,529,458	6/1996	Humpherson	416/20 R
5,662,291	9/1997	Sepp et al.	244/3.13

OTHER PUBLICATIONS**Definition of "Bullet" from Fundamental of Small Arms,
U.S. Army Ordnance Center and School, Oct. 1988.****Primary Examiner—Charles T. Jordan****Assistant Examiner—Christopher K. Montgomery****Attorney, Agent, or Firm—Mills Law Firm PLLC**[57] **ABSTRACT**

A small caliber laser-guided bullet having a self-contained guidance system is disclosed including on-board laser sensors and navigational circuits capable of detecting a laser target signature, determining the deviation of the bullet from an optimum projectory along which the bullet would impact a hostile target, and generating an electrical signal to piezo electric steering control surfaces to effect a change in the course of the bullet. The guided bullet utilizes a plurality of symmetrically-arranged laser sensor elements which are positioned about a longitudinal axis of the bullet. The laser sensor elements function to transmit optical radiation from the laser target beam to photo detector elements housed within the bullet. The electrical signals from the photo detector elements are then amplified and processed by semiconductor logic circuits to produce the functions required by the steering control surfaces to translate the bullet to the optimum trajectory. Electrical power for the guidance system is provided by a miniature lithium-polymer battery which is interconnected with the navigational circuits to produce the functions of the system. The guided bullet is fired from a precision, smooth bore weapon using a conventional expanding gas cartridge and is effective at ranges up to 3,000 meters and beyond.

16 Claims, 11 Drawing Sheets